PATENT

In the Specification:

Please delete the paragraph on page 17, lines 13-17 and replace it with the following new paragraph.

The exemplary arrangement 300 may be supported by the following theory. First consider a single electrode placed in an electrically homogenous medium (e.g., having resistivity [[□]] ρ) and having a current I measured in amperes. The potential, U, measured in volts, at any point in the medium is given as:

Please delete the paragraph on page 18, lines 22-27 and replace it with the following new paragraph.

Note that Equation 2 relies on a resistivity [[□]] ρ that corresponds to an electrically homogenous medium; a discussion of various exemplary techniques that pertain to non-homogenous media and impedance appears further below. Further note that use of Equation 2 for displacement measurements in relationship to percentage change, etc., in potential does not require knowledge of resistivity [[□]] ρ, see Equation 4

Please delete the paragraph on page 22, lines 1-19 and replace it with the following new paragraph.

As mentioned above, Equation 2 relies on a resistivity [[□]] ρ associated with an electrically homogenous medium. Depending on the circumstances, such an assumption may suffice. For example, changes in an average resistivity with respect to time may have an insignificant effect on sensed potential when compared to changes that occur in sensed potential with respect to displacement. Referring to Fig. 4, note that a 2 cm change in displacement of the sense electrode along a line toward electrode A (e.g., an electrode positioned at a distance from a pacing device) resulted in approximately a 150% change in potential. This is due to the relationship between the variables r_A and r_B of Equation 2 and the potential. In contrast, according to Equation 2, the resisitivity [[□]] ρ would have to change by 150% to have a similar effect on the potential. Thus, in some circumstances, changes in resistivity [[□]] ρ may have little effect on the sensed potential compared to displacement. In addition, for a potential measurement that includes a device case as part of a sensing circuit, the

effect of changes in a chamber's blood volume may have an insignificant effect on an average resistivity [[□]] ρ because the composition of the media in the potential field remains relatively constant (i.e., averaged over a volume that is much larger than chamber volume).

Please delete the partial paragraph on page 22, lines 21-31 and replace it with the following new paragraph.

For circumstances that warrant knowledge of impedance for compensation or correction of distance or displacement or for determining other useful information, an exemplary device and/or an exemplary method may rely on direct and/or indirect impedance measurement. In general, resistivity [[□]] ρ of a heterogenous medium will depend on resistivities of component media and amount of and/or orientation of component media. Regarding cardiac impedance (e.g., between opposing walls of a chamber), an average resistivity may depend on myocardial resistivity, blood resistivity, blood area/volume and orientation, and myocardial area/volume and orientation. Blood area/volume certainly varies with respect to time and, where warranted, impedance techniques

Please delete the partial paragraph on page 24, lines 1-12 and replace it with the following new paragraph.

where R is resistance in ohms, [[□]] ρ is resisitivity of the conductor in ohm*cm, L is the distance between two electrodes in cm and A is the cross-sectional area of the conductor in cm^2. A current I is applied to the two electrodes and a potential U is measured in volts between the two electrodes. A resistance R is calculated by dividing potential U by current I. Resistivity [[□]] ρ of blood is known _a priori_, which allows a determination of A, the cross-sectional area of the conductive blood. A series of electrodes on a lead may be used to determine a series of cross-sectional areas A_i for a series of distances L_i. Individual volumes V_i (e.g., $i = 1$ to n) may be determined by multiplying A_i and L_i and a total volume V_T by summing the individual volumes V_i.